TABLE OF CONTENTS

- **Content: The Promise of New Media**
Much of the promise of digital media is based on content -- the combination of video, audio, graphics and textual information that many believe is shaping a new, rich form of communication. The delivery vehicles range from CD-ROMS to interactive videodiscs to fiber-optic telephone lines, cable tv and satellites. As a result, digital content is reinventing publishing.

- **Interactive Markets: There Is No There, There (Yet)**
Devoting a career to creating and publishing interactive optical disc-based media products is a risky business, right up there with buying real estate via mail-order catalog. There's no installed base, not one you'd notice, anyhow; and production tools are still primitive. Potential customers, not to mention investors, are still skeptical about the benefits of interactive stuff -- if they understand the concept at all. Interactive multimedia isn't yet the kind of job for a lone genius. It's a collaborative, costly process.

  How will producers survive until a market catches up with their vision? We asked experts at five companies -- GTE ImagiTrek, Interactive Productions, Philips Interactive Media, The Voyager Company and Broderbund Software --to shed some light on the mystery.

- **Publishing Today: The Electronic Piñata**
Are we headed for a paperless future or not? The consumption of communications paper in the United States has grown at a rate greater than the growth in gross national product for every year since World War II. Meanwhile, the consumption and growth of electronics for communications purposes has increased much more rapidly. Paul Saffo, research fellow at Institute for the Future, believes that the publishing industry today is like a huge electronic piñata, a thin paper crust surrounding an electronic core.

- **I/O**
Television is finally getting easy.

- **Microsoft's play for consumers**
Now it's talking about Windows on consumer players.

- **Expansive HDTV**
A newly hatched spec may work with computer displays, too.

- **If it worked for print publishing. . .**
Digital F/X establishes service bureaus for off-site video editing.

- **Teaching media skills to kids**
New videodisc project focuses on electronic literacy.

- **Adobe buys Super-Mac's ReelTime**
Seminal publishing firm moves decisively into desktop video.

- **Fuji and Zoran**
  Alliance strives to improve the quality of digital still video.

- **Arnold joins Bill Gates at IHS**
  Steve Arnold leaves Lucas to head Interactive Home Systems.

- **Content**
  This month, the "interactive movie" Spaceship Warlock.

- **Events**

FOCUS
CONTENT: THE PROMISE OF NEW MEDIA
No matter what delivery vehicle, it's on the road

Much of the promise of digital media is based on content — the combination of video, audio, graphics and textual information, folded into a multisensory experience that will shape a rich, new means of communication for tomorrow.

Content comes in many forms today, and there are more on the drawing boards. Already, the applications sold by today's successful (read: profitable) content providers — most notably, CD-ROM-based text and graphics databases — seem almost mundane, despite the fact that 20 years ago, the thought of publishing thousands of pages of text or hundreds of clip-art images on a single, silvery disc was a fantasy to most people except, perhaps, Vannevar Bush, who first wrote about such a concept in the 1940s.

The near dead and the unborn. After a brush with mortality, content-laden videodiscs — connected to personal computers for the sake of interactivity — have risen from the ashes as "video textbooks" of sorts, and they are being welcomed into schools as a way to help teachers re-engage a generation of video-saturated children into their studies.

Other delivery vehicles for content loom in the future: cable television, consumer satellite services and the phone companies will battle it out to provide interactive television programming, where the once-passive viewer participates in the program. They're liable to tussle as well over the provision of media-enriched online databases — accessed via fiber-optic telephone lines — to deliver information services, shopping and entertainment.

Interactive CDs loom. Looming nearer on the horizon today, however, is the interactive compact disc. Similar to the screamingly popular audio CD, the so-called "CD-ROM" (for compact disc, read-only memory) can contain digitized text, photographs, graphics and, with increasing frequency, video as well as audio.

Most of these products are made interactive via the connection of a CD-ROM drive to a computer (at this point, the Macintosh is the computer of choice), which provides a way to browse and/or interact with the information via keyboard or mouse. Today only a handful of companies produce these disc-based "multimedia" products, though their ranks are growing.

And "consumer players" that connect to a television monitor (essentially, computers that come with compact disc drives and without keyboards or mice, using instead a remote control device), such as Commodore's CDTV and the Compact Disc-Interactive (CD-I) standard proposed by Philips, have been motivating a new breed of developers as well.

A Mac-like zeal. Most developers and producers of these interactive, media-based products come to the task with a zeal much like that of Macintosh software developers in the early days.

Mac software developers also had a long wait before a market caught up with their vision. And similar to early Mac developers, die-hards such as Voyager and tiny startups such as Interactive Productions are staking their futures on interactive technologies, while larger companies can afford to bide their time.

How long can they wait? But how long can any of them afford to wait for a standard consumer player, or even a decent, media-capable computer that will allow us to participate in their visions? How do they decide which platforms to develop for today? What does it really take to produce an interactive media title, in cash and human labor? How are the little guys holding on, and how will the big players such as Sony and Time-Warner affect their ability to wait out the long stretch between vision and market?

Though we will explore all the various genres of content publishing in upcoming issues of Digital Media, the following story will examine the business strategies of this new breed of interactive developers — where they're staking their bets and how they're feeding their families and paying their rents until the rest of the world decides that the ability to interact with media in all its myriad forms is an idea whose time has come.

Denise Caruso

THERE IS NO THERE, THERE (YET)
With no market and little funding, disc-based products are labors of love — and faith

Devoting a career to creating optical-disc-based media products is a risky business, right up there with buying real estate via mail-order catalog. There's no appreciable installed base, and production tools are still primitive. Potential customers, not to mention investors, are still skeptical about the benefits of interactive stuff. And unlike in the world of computer software, a lone programmer cannot merely sit in his or her bedroom and plunk out a code. Creating multimedia is a collaborative, costly process — most estimates for interactive titles with a noticeable amount of visuals hit in around $200,000 or higher.

There's just no market yet. But "yet" is the operative word, and each of the companies surveyed below plans to get to "yet" is a study in what it takes to launch a new technology into the mainstream. The big question is "How long can they hold out?" Their answer: "As long as it takes."

GTE IMAGITREK
A phone company with an eye to the future

Alan Rinkus is the business development director of multimedia projects for the ImagiTrek division of GTE Corp. — yes, that GTE, the international telecommunications design and production facility to develop optical-disc-based games, magazines and interactive music, education and training projects.

Understanding the issues. What's unusual about ImagiTrek's business plan is its eye to the future of fiber optics into the home. "GTE is looking at the long term from a digital content point of view, being a carrier that will be putting in more fiber optics," says Rinkus. "As a corporation, they need to understand how content is being produced and shaped. In the long term, strategically, what we're doing helps them understand those issues."

After winning a special dispensation from the Federal Communications Commission, GTE set up a test facility and state-of-the-art laboratory called "Mainstreet" in Cerritos, CA, and is testing the delivery of different consumer services over coaxial and fiber-optic cables into Cerritos homes.

Though it's funded by GTE, ImagiTrek is a for-profit operation, says Rinkus, and "depending on which month," it has already turned a profit by selling its projects to media partners, which reduces the financial risk to both parties.

Delivery to the home. "We're a long way from platforms becoming moot," he says. "Applications will migrate from the compact disc and merge with the online delivery of programs — there will always be some form of offline delivery that's optical-based. I don't have a crystal ball that will say which standard will make it — but in the middle of that, the phone companies will play a large role in how these technologies are shaped."

[[paragraphs in hard copy are missing here]]

ImagiTrek produced, designed and originated the concept for the innovative roundtable on Verbum Interactive, the first CD-ROM-based magazine (see Vol. 1, No. 3, p. 22). It produced an interactive videodisc for the game maker Sega called The Hologram, and it is working on a Japanese version. ImagiTrek is also working on a Compact Disc-Interactive (CD-I) application demonstration disc for Philips Interactive Media. "Today we look at CD-I as being more competitive in commercial applications, as opposed to consumer," he says. "That will change over the next two years."

Rinkus believes there is an element of passion to working with interactive media. "But there is also a pragmatic approach that we take to the business, so we review market penetration, predictions and techniques very carefully," he says. "We understand how to produce them, how much they cost to produce, and we also understand how they can be sold. Is that profitable? That's very questionable at this point. But they can be, on occasion, and you strive for that."

INTERACTIVE PRODUCTIONS
The quintessential new-media entrepreneur

Rob Fulop, founder of Interactive Productions in San Mateo, CA, doesn't have ImagiTrek's corporate safety net. A former game producer at Atari (he developed the computer version of

Space Invaders, among other titles), Fulop has long been smitten with interactivity and how it can help people collaborate. He is, in senses, the quintessential entrepreneur for a new technology — with all the attendant sorrows and joys of having great ideas and trying to find time and money to bring them to fruition.

Another component. So how does a fledgling company such as Interactive Productions support itself until the market happens? "Basically, I don't think you can be exclusively in the titles business without having another component," he says. "There are two ways to support yourself in the titles business. One is to get advances from people who put out a piece of hardware. The other way is to work for hire, or consulting — a company has a new piece of hardware and they need some help to make sure it's the best. Or Apple goes to a trade show four times a year and they need someone to do booth stuff. Or Microsoft wants to send out a piece of direct mail on a floppy.

Right now, he says, consulting occupies about 10 percent of his time. That's good news — last year, work-for-hire was well over half is business. Fulop today has two CD-I titles in productions, funded by Philips Interactive Media, and two in the design phase.

In addition, Fulop has an ongoing business doing online games and 16-bit video games. "I couldn't make it doing exclusively optical discs, because the advances aren't enough to cover the overhead," he says.

Right now, Interactive Productions is focusing on CD-I products in what Fulop calls "entertainment with an enrichment touch to it. For example, I'm very big on doing something for kids, to help kids learn how to make video. I also like things that teach collaboration, how to work together."

Sticking with CD-I. A difficult question for a developer such a Fulop is which player to develop for, since his success depends on the player's success in the market. At this point, he's sticking with CD-I. "From my perspective of the universe right now, CD-I has the best chance," he says. "I've talked to this whole industry, as a very skilled producer with really neat stuff to show them. And from our perspective, Philips is who's coming to the table actively, soliciting titles to get done. We could talk to Sony and Nintendo forever, but the Philips people write a check."

And that's the bottom line. "The question is not necessarily what's the best player, but where you get the money to develop stuff," he says. "CD-I might not be the best player; any piece of hardware that works in the consumer market is always inferior to what it could have been. But there's no way in the world I can raise independent financing to do an optical disc yet. We're all trying to make TV show before there's a television, that's what it is. It's not like there's an optical industry that's not doing well. There is no industry. And it's a couple year before there is an industry."

Profitable in 1993. Fulop, who's just signed MacroMind president John Scull as a partner, says he believes Interactive Productions will have a profitable year with optical disc titles in 1993. "That's when the titles will start paying for themselves," he says. "It will then make sense to do

nothing but make titles and be self-sufficient. Right now, you're just dumping money in and hoping you'll make money back later."

To be profitable, he says, the company will need to be able to publish a title every couple of months. It will do so using templates and "formats," such as comic books, which lend themselves to series production. "The appetite for this stuff will be voracious. If it's taking a year or two to do a title, that's just research and development," he says. "A title a month is a lot, but the guys that made money in the movies — like Keystone Productions — figured out a way to make a show every couple of weeks. They just turned the crank. Those are the kinds of products we're really focusing on the most right now."

"VOLUME WILL NOT DRIVE THE MARKET"
CD-I producer/publisher Garry Hare goes against the grain

As a long-time producer, Garry Hare — founder of interactive entertainment company Fathom Pictures in Sausalito, CA — was well acquainted with the economic vagaries of creating products for a market that doesn't exist. He was also "single-minded" about the media he wanted to work in, and the kinds of hardware he wanted to develop products for.

Those two components were not exactly a formula for success. How did he survive? "I was a very high-priced organizational consultant two days a month, and my wife worked," says Hare. "If it weren't' for that Fathom would have folded years ago.

It's not that Hare wasn't busy during those lean years. Fathom created the first interactive movie, called Matchmaker, and the first interactive point-of-sale kiosk. It produced titles in association with ABC Sports, the National Football League, the Professional Golfers' Association, Lucasfilm, Norman Lear's Embassy Television and Warner Communications.

Today, Fathom is a $5 million company, developing titles funded by Philips exclusively for CD-I. And Hare, who's resigned from his salaried position and appears on-site at Fathom only for creative and financial reviews, is now president of Philips Interactive Media Europe.

His unique position as a producer has given him a certain amount of insight about developing interactive titles — "There's a lot of blood on the floor here, much of it mine" — and his view of how CD-I will win market acceptance is vastly different from the company line.

Vision-driven software. "Everyone says, 'You need 150 titles to create the consumer market,' but volume will not drive the market for CD-I," says Hare. "What's required is a niche strategy — targeted, market-driven applications. And one piece of vision-driven software could do it."

This seems diametrically opposed to the view held by Philips, which has invested multi-millions of dollars in creating a massive titles library to push CD-I into consumer' homes. Hare believe an equal amount of energy should be expended developing the corporate commercial market, and he plans to implement just such a strategy as soon as possible.

The first move, he says, is for Philips to get serious about professional publishing — a market that Hare believes can be a giant moneymaker for Philips — by helping producers think about its potential in commercial applications.

As part of this strategy, Philips must develop market research resources to develop these niches markets, and it must introduce producers to those markets so they can become successful immediately. Rewarding success in that way, Hare believes, will keep talented producers developing titles for CD-I.

Hand puppets. For example, a pharmaceutical firm asked about using CD-I for an interactive learning title on pregnancy, to put in doctors' waiting rooms. "It's a good consumer title, too — people would pay money for it. We were lucky we had a similar title laying around that we could adjust a little, say 'So and So presents…' on the title screen," he recalls. "But usually we walk into companies and expect them to visualize this stuff like hand puppets. We need to spend as much time on previsualizing the potential of the professional market as we do the consumer market. If we hadn't had a title in-house to show them what could be done with CD-I, we couldn't have explained it."

Corporate-sponsored educational discs could ease development costs and give companies another venue for name recognition, he says. Already, a large financial institution is funding an educational product about money, markets and how the system works. Using the same basic structure for a variety of corporations, Hare says, Philips can approach a company and say "We'll commit to the education market, but we need your help." In this way, CD-I titles for schools can be provided either free or very inexpensively, while retail versions are made available at the same time at a low cost.

"We can get corporate participation until the producer breaks even," says Hare. "It's good business. Even if they only sell 5, 000 copies, it doesn't require marketing money." This is important when, as Hare says, high-end CD-I titles can cost from $200,000 to $400,000 to produce.

At the same time, he says. "We have to be more realistic about pre-unit royalties," he says. "Today producers fund advances against breaking even, paying royalties on a percentage of gross wholesale. But with zero machines installed, or even half a million, 10 percent is nothing if there are no profits. We need to pay developers per unit sold to reward success."

Another radical, yet sensible, thought is that producers should become resellers of CD-I machines. "They know the markets better than we do," he says. " this builds the installed base and helps producers be successful more quickly.

THE VOYAGER COMPANY
Working at breaking even

Bob Stein, a partner and cofounder of the seminal Voyager Company in Santa Monica, CA, makes no bones about Voyager's business strategy in the business of disc-based media. "We haven't made much of a profit yet, but we're really good at breaking even," he says. "That's been our strategy for years — to break even."

Voyager is the joint venture with New York-based Janus Films and Stein runs the company with partners Aleen Stein and Janus's William Becker and Jon Turell. With no outside funding, Voyager is now an $8 million-plus business with 70 employees. It's been selling interactive

videodiscs and software since late 1989 and is the most highly regarded company in the business today.

The yardstick of quality. The company had already built a strong reputation on its Criterion Collection of definitive films on laserdisc, and its newer multimedia titles are now also considered the yardstick by which quality is measured. They include the National Gallery of Art Laserguide, the CD Companion to Beethoven's Symphony No. 9, a series of discs for children called Amanda Stories, and most recently, a moving CD-ROM photo-and-sound essay by one of Latin America's most prominent photographers, Pedro Meyer. Stein says Voyager has seven more CD-ROM titles coming out this fall.

But despite Voyager's reputation, Stein is brutally realistic about his market, and he is committed to making Voyager last for the long haul. So far, it's worked. "We've been very canny, and we put our money where it counts," he says. "We haven't done much advertising or marketing. We concentrated on making products, then we let word-of-mouth carry it."

As a result, the company hit so many home runs in so many areas that everybody wants to deal with it. One company, says Stein, loaned Voyager a quarter-million dollars to produce several products. "If they sell, we pay them back out of revenues." he says. "If they fail, they don't get their money back."

Picking the player. Stein says the company spends an amazingly frugal $20,000 to $100,000 on each CD-ROM title. All of Voyager's discs are based on the Macintosh right now, but its first Microsoft Windows-compatible products will be done this year. As a devotee of breaking even, he must pick his hardware carefully — despite the fact that he's courted IBM, Apple, Next, Sony, Panasonic, Philips, you name it.

"Everybody out there wants Voyager to do stuff for them, but the question is whether there's any machines," he says. "At the moment, we're doing just CD-ROM. [Commodore's] CDTV I think we can pretty safely say isn't going to make it. CD-I, we'll find out. But the player that I'm most interested in right now is a notebook computer. Someone will sell a lot more notebooks than Philips will CD-I devices.

Despite their present monomedia capabilities, Stein is interested in notebooks because Voyager is going to publish a series of floppy-disk-based books — including Martin Gardner's Annotated Alice in Wonderland and Douglas Adams' Hitchhikers Guide to the Galaxy. "Dedicated multimedia players I think are a ways away," he says. "I'm not interested in things that play on TV sets because the resolution is so low. Philips said they're putting Shakespeare onto a CD-I disc — can you imagine reading Shakespeare from your TV? That's completely the wrong direction."

Publishers can't jump-start it. The right direction says Stein, is "high-density, information-type products" that he can sell in small numbers and still break even. "We're a small publisher not by virtue of our vision, but because the market is small," he says. "I don't think a publisher can jump-start the market because the hardware isn't there. We have a few years worth of interesting,

elegant work that people are excited about, but that aren't breakthrough products in terms of market share. That's it. That keeps our reputation up."

Much of Voyager's successful reputation, says Stein, is driven by intangibles. Titles are produced because of "gut stuff" — the intuitive knowledge that they will be of value. "You're dealing in cultural values and ideals, and you can't be driven by a need to make a profit," he says. "I don't mean to sound sappy, but it doesn't work if all you're thinking about is making money. You have to think, 'How do I get these ideas out?' In the long run you have to make money, but that shouldn't be why you get started."

BRODERBUND SOFTWARE
CD titles are easy on the bottom line

Despite any natural proclivity the creative minds at Broderbund Software might already have toward disc-based media, for chairman Doug Carlston it boils down to this: his CD-ROM products are cheaper to produce than computer software.

Though Carlston says disc-based media are "zero percent of our business right now," a CD-ROM-based version of the hugely successful Where in the World is Carmen Sandiego? title, to run under MS-DOS (with MPC and Macintosh versions to follow), is in beta test. It has 130 digitized photographs, 150 traditional and folk-music samples, more than 10 talking characters, 500 digitized foreign language clues and hundreds of animations.

Cost of goods. In addition, Broderbund is developing a new line of animated, talking children's stories on CD-ROM called Living Books. "It's usually a truism that as storage capacity expands, costs go up accordingly," says Carlston. But this isn't the case for CD's which for 75 cents hold what would cost $5 to store on floppies. Carlston says those aren't significant numbers if you're talking about a $250 piece of software, but when it's a $50 entertainment product, Broderbund's margins increase significantly as a result of lowered cost of goods.

He says the cost to produce a Living Book will eventually be under $100,000 — "substantially less" than a typical floppy-based title. "At this point, we're building engines for each optical platform, so we can just go directly from the data stream to the product, with no programming at all," says Carlston. "When we started this project two years ago, we decided the 'virtual machine' approach was the only way it seemed to make sense — it was a simple programming question. There was no rush to market, because there was no market."

Audio is cheap. Unlike many developers of disc-based media, Carlston doesn't tear his hair out about motion video and all its attendant costs and headaches. "A lot of content can be acquired at low cost," he says. "It's not very hard to take a graphic material, scan it, touch it up and animate it. Textual content is more expensive than voice, so we don't worry about it — we use lots and lots of audio instead. To the consumer, it's like the movement from silent movies to talkies."

Since consumers are already accustomed to using a lot more data than they produce, he doesn't think the "read-only" capacity of CD-ROM is likely to bother them "if the play is cheap enough." But today, the only real "players" are relatively expensive computers.

Unfortunately, he says, he's not banking on that situation changing. "We've had a lot of conversations with a lot of people," he says. "We've had multiple experiences of being promised production and delivery dates that have evaporated that we'll believe it when we see it."

THE ELECTRONIC PIÑATA
Making sense of the shift from paper to electronics over the next two decades

Paul Saffo is a research fellow at Menlo Park, CA-based Institute for the Future, studying the long-term business effects of new information technologies. Here, Saffo uses the metaphor of a piñata — a papier-mâché balloon filled with gifts and goodies — to illustrate the point that the effect of technology on the publishing industry is much greater than it appears.

Are we headed for a paperless future or not? I think that a curious paradox in the way we consume paper offers an important clue. The consumption of communications paper in the United States has grown at a rate greater than the growth in gross national product for every year since World War II. Meanwhile, the consumption and growth of electronics for communications purposes has increased much more rapidly.

The relationship between the two is spherical — it parallels the relationship between the surface area and the volume of a sphere. As a sphere expands, its volume inside increases more rapidly than the surface area.

ELECTRONICS ARE THE HIDDEN CORE

The publishing industry today is like a huge electronic piñata, a thin paper crust surrounding an electronic core. The paper crust is what consumers see, but it is produced by a hidden core of enabling electronic technologies. For example, the Wall Street Journal is written and edited on computer screens, and then the final copy is bounced off satellites to remote printing plants all over the country, just hours before the presses begin to roll.

In offices, the same pattern explains why electronics have not replaced paper, but merely accelerated the production of greater volumes of paper than ever. Xerographic copiers are a classic piñata technology — they automated paper generation.

Shallow dives, deeper dives. Think of the copier as lying just under the surface of the piñata, with users and information on the outside. The copier represents a very shallow dive into that electronic core because when you slap a page onto the glass screen, the image is converted into electronics only long enough to make another copy. There's no manipulation going on.

Desktop publishing — a laser printer hooked to a PC — goes a bit deeper, since now the technology is used to manipulate the image. The Wall Street Journal goes deeper yet, exploiting a suite of computer and communications technologies to produce its daily edition.

The piñata model also offers a useful metaphor for thinking about relationships among the different pieces of technology. For example, the laser printer is really just a typesetter for copiers in offices and for small newsletters and the like (see figure 1), the two technologies occupying

adjacent positions on the sphere, and the information skipping in and out of the sphere as it goes from idea to electronics to paper, to electronics to copy.

A fundamental change. The way that we used paper changed fundamentally when desktop publishing arrived. We think of paper as a communications medium, but it has really been a storage medium above all.

Sometime in the mid-1980s, it became cheaper to store information electronically than on paper. Paper today is an interface rather than a storage medium. It is an increasingly volatile, disposable medium for viewing information on demand. We are well on our way to a future in which we reduce information to paper when we're ready to read it, then promptly dispose of it when we're done.

The cross-impacts of various pieces of electronic technology and paper output are what make forecasting the future of new media so wildly unpredictable. Recall that Apple failed to recognize the desktop publishing explosion because it didn't think about what would happen with copiers and LaserWriters together. Fortunately, the market explained it for them.

THE CHALLENGE: BLEND OLD AND NEW

The challenge in new media today is to elegantly blend old and new into compelling new products. More bluntly, it is to tame raw new technologies into compelling media of expression.

Two strategies suggest themselves. First is to use electronics in ways that leverage paper in interesting and new forms. One example is that of newspapers combining 976 response numbers with personal classifieds. The print ad is given free to would-be advertisers because the profits from the 976 responses are so large.

Diving deeper. Other examples, such as database publishing, dive deeper into the electronic piñata, exploiting sophisticated computer, communications and printing technology to create custom and semicustom products. Examples include selective binding in advertising and the McGraw-Hill/R.R. Donnelley effort to create customized textbooks (i.e., order the pages you want). Perhaps Kinko's will end up as a partner as well.

More personal technologies, such as facsimiles, will be sucked into the vortex. Interactive fax reader response systems being used by magazines are one example. This substitute for mailed-in reader response cards provides instant consumer gratification and better preference capture for advertisers.

In the longer run, though, the Group 3 fax standard will probably become the equivalent of ASCII text for the 1990s — the default text and data transfer format for a whole menagerie of information appliances that will crawl into our cars, briefcases, pockets.

PAPER INTERFACE, DIGITAL STORAGE

For the foreseeable future, paper will remain the dominant interface in publishing. But it is going to become increasingly a transient display and control medium. A historical note: paper has been a control medium ever since Hollerith invented the punch card to control his census calculators

in the late 1800s. Add in environmental trends, and it is clear that paper will become short-lived, lightweight, ever more biodegradable.

But the dominant form of storage is going to be digital. You all are familiar with CD-ROM, and that suggests something yet bigger is going on.

Holes and thin spots. As the balloon expands, thin spots and holes begin to appear. These gaps represent places where paper is eliminated. So far, holes have been exceptional cases, or outright failures. Videotex was one such failure, but Minitel is a modest, solid success. I should add, though, that Minitel was intended to replace paper directories, but now the French print more than ever. Actually, Minitel proved to be a replacement for the telephone operator information service.

The holes and thin spots appear in very odd spots on the piñata's crust, but the holes also are growing, and they're beginning to drift together. These are the first halting signs of a new paperless world. It will take about 30 years for it to happen completely, but the process is well under way today.

Unexpected competitors. Competitors on the surface will come from unexpected areas. Publishers are fighting for market share with each other. Meanwhile, Sony is trying to become a vertically integrated information company in a new information world where it will own the software that goes on the disks it presses, which play on the drives it builds, which are installed in the machines it sells.

Incidentally, this isn't a new strategy — RCA did the same thing in the first half of this century with the radio business when phonograph records came along. And the phone companies are dying to get into the business, recently with the reluctant blessing of Judge Harold Greene (see Vol. 1, No. 3, p. 7). His reluctance has good historical basis. The phone company invented the radio advertisement in the 1920s and then tried to patent it — without success, fortunately.

The telcos pioneered television distribution in the 1950s via coaxial cable, and then, with the Telstar satellite, they got into television broadcasting. They also invented movie sound, and now they're eager to get involved again, having decided that the only way to pay the bill for optical fiber to the home is to deliver television and information services.

Editorial functions change. Finally, the piñata metaphor also explains how editorial functions are changing. Newspapers are organizations whose inventory walks home every day after work, and their relationship with their readers is rather remote — a 90-degree relationship (see figure 2), limited to the odd editorial letter and the like. But the changes in electronics will make the relationship much more intimate.

READER BECOMES EDITOR

At the extreme, the editor and the reader will become the same individual, as on today's online services such as Dialog and Nexus, where users do their own editing on the fly. At a commercial level, the Dow Jones news service is the first example of a compelling blending of print-based human editors and electronics.

A computer in Princeton "watches" for certain kinds of events, such as a stock moving to an unusual level, and alerts a writer at the Wall Street Journal in New York. The writer then takes a quick look at the event and offers a first impression to electronic customers on DJ.

In turn, the alert also helps writers with their editorial work at the Journal. Paying attention to the distance on the sphere between editor and reader is very, very important in how you position and think about your products.

New headaches. Five years ago, the problem was that everybody was worried about electronics, but there weren't any options to really do things with. Today, we're all involved, and the headache is not finding an option but picking among the various options that are available — videotex, audiotex, pc-based things, television-based things, wireless delivery, wire-based delivery. It was Marshall McLuhan who observed, "I don't know who discovered water, but it was not a fish." His message is that to succeed, you've got to step back and take a larger and longer view of the information industry, because seeming competitors may be your most important strategic partners, and vice versa.

And telling one from the other, competitor from partner, on the piñata will be very hard indeed. For example, Apple and Microsoft can't decide whether they are partners or enemies. Ultimately, though, your biggest enemy could be yourself. There's an old Pogo cartoon that says, "We have met the enemy and he is us."

That's true. But there's a second frame of the Pogo cartoon that we forget. It read, "We are surrounded by insurmountable opportunity." I think that's very much the situation for companies in new media today.

Paul L. Saffo

I/O
READERS RESPOND

TELEVISION MADE EASY: RECLAIMING FREEDOM OF SPEECH IN A WORLD OF VISUAL MESSAGES

Douglas Crockford
LucasArts Entertainment Company

Television is hard. You cannot imagine the technical difficulties that must be overcome in order to create programs for television. The equipment has always been extremely expensive, fragile and temperamental, and it requires constant tweaking and engineering by skilled broadcasting specialists.

The same technologies that helped make computers better will make television better. I don't mean that the programs that come over the networks will be any better. This is a different kind of better.

TELEVISION IS BEING MADE EASY

The machinery of television is being reinvented using computer technology, replacing old analog stuff with digital. This will fundamentally change the medium far beyond the obvious functional improvements.

Computers are both improving production values and making the production of programs easier. With digital technology, television can be put to uses that go beyond its original intentions, and give viewers more control.

And as the technology matures, it will become possible for people to produce programs themselves. There are glimmers of this capability in the popularity of camcorders, which, combined with the next generation of desktop video systems, will give a single person the power of a video production crew. The importance of this goes well beyond capturing pratfalls for America's Funniest Home Videos.

A compelling, worrisome view. Television has been our electronic eye on the world, presenting to us people, places and events which most of us would never have seen otherwise. The view offered by television is so compelling that most of us now receive most of our information from this medium.

This worries me, because I have never seen a story of which I had first-hand knowledge that television got right. I don't believe that this is due to any liberal conspiracy or bad intentions or lack of skill on the part of the people who work in television. It is due to the fundamental limitations of any medium.

A medium is the thing in the middle through which information flows. It is the way, but it is also in the way. No medium can deliver all messages without distortion. Every medium causes aliases, subject to its own biases and constraints.

THE NEED FOR VIDEO LITERACY

It has always been supposed that television viewing requires no training, unlike reading, but that is not so. There are messages that television cannot deliver. One of those is the message about its inherent biases and constraints. Most people get their information about television from television, and television cannot tell them about what it cannot tell. What you see looks true and complete, but it is not and cannot be. We accept it because we think that seeing is believing. That can really mess up your world view.

Video literacy should be considered a vital skill in the Information Age. In order to watch television intelligently, it is necessary to understand its biases and constraints. The best way to learn is the way the pros do: by making programs.

Learning the subtleties. Personal video production systems can provide all of the functions required to make television programs. These systems will couple portable digital video with powerful computers and snazzy interfaces. The systems can be simple enough for children to use, and cheap enough for families and schools to afford.

Using these systems, students will learn about the subtleties of television, about how it is more important to be interesting than accurate, and how you have to lie to tell the truth.

The word the pros use to describe this is "works." Saying "the shot works" means that the shot can go through the television channel without further distortion because it has been already been properly filtered. It does not mean that the shot represents reality. What it's about is really a subtle form of self-censorship.

Two-way television. The greatest blessing of the new television technology is that television will no longer be a one-way medium. Two-way television is often imagined as letting us guess the letters on Wheel of Fortune, or being able to instantly purchase the products we see advertised. It is much more important than that.

In the current technology, a very tiny minority makes all of the messages for everyone else. Our access to the most important medium of mass communication is so limited that we have effectively lost the freedom of speech.

RECLAIMING OUR POWER

Making programs with personal video production systems will be no more difficult (ha!) than writing books with word processors. The point isn't that everyone will do so, but that we will have the right and enabling technology if we choose to. Programs will be distributed instantly through fiber cable TV or broadband ISDN. With digital tape technology, a program can be passed around and copied all over the country with very little degradation from the original. The message still comes through.

This freedom is being restored to us just in time, as we see more and more consolidation of media companies into global giants. This is not to suggest that there is anything sinister or unwholesome about Big Media. It is just that without access to the tools that facilitate freedom of speech and freedom of expression, democracy cannot survive.

I/O welcomes comments and commentary from readers. Send them to Digital Media, 37 Prosper St., San Francisco, CA 94114; fax (415) 626-5426.

NEWS
WILL MICROSOFT ENTER CONSUMER MARKET?
Software giant shifts strategy, hints at move toward player software

On the eve of the Multimedia PC (MPC) launch (slated for early next month), it appears that Microsoft — which to date has been a staunch public supporter of the pc-based multimedia paradigm — is considering a shift in strategy toward the consumer market.

Though Microsoft now says it has always considered the consumer market a possibility, it has only publicly committed to the computer-based multimedia market via the MPC and Multimedia Extensions to Windows.

During a meeting in late August discussing the shipment of Windows with Multimedia Extensions to developers, Rob Glaser, general manager of the Microsoft multimedia systems

group, said that Microsoft is now more closely evaluating the possibility of supplying system software for the consumer player market now being developed by companies such as Sony, Philips. Apple, which recently started a consumer division, is thought to be preparing such a product as well (see Vol. 1, No. 3, p. 5).

"What we were saying privately, when asked about the consumer market, was 'Later,'" said Glaser. "Now that MPC is about to ship, we are looking in a pretty active way at how the technology you see in Multimedia Windows, with some additional hardware, can play in sub-pc configurations — more than we were looking at it a year ago, and even more than we were six months ago."

Modifying the pc-centric approach. Until now, Microsoft has viewed multimedia as a means of getting personal computers into the home. The "consumer" (presumably hand-held and/or television-oriented) multimedia player has been treated as the competition. Publicly, Microsoft said the consumer would buy either a multimedia computer or a multimedia "player" — not both.

It appears that's no longer the case. "There's a bunch of stuff you can do better than [Compact Disc-Interactive, or CD-I] that's compatible with Multimedia Windows," said Glaser. "We don't make hardware, so we can work with people who do make hardware."

But the hardware is only one part of the consumer equation; the content is different as well. Most people now believe that multimedia applications for the computer market will differ significantly in function from those for the TV-plus-player market targeted by companies such as Philips with CD-I and Commodore with CDTV.

Information vs. entertainment. Computer-based applications for multimedia are more likely to be centered around the delivery of information, such as media-enhanced versions of dictionaries, books and encyclopedias. TV/player combinations are likely to be more heavily entertainment-oriented, using full-screen, full-motion video and targeted toward game-style applications.

Apple, which had originally pursued a computer-centric strategy, recently switched to a "if you can't beat 'em, join 'em" approach. Rather than being incompatible rivals, consumer multimedia players and multimedia computers should be compatible and should be able to play the same titles. (See "Apple vs. Microsoft," Vol. 1, No. 1, p. 7.) Now it appears that Microsoft is (wisely) heading in the same direction.

Possible partners. Who might be Microsoft's potential hardware partners for a consumer player? Tandy is an obvious choice. Tandy, which is announcing the shipment of its MPC-labeled computer on September 26th, is Microsoft's lead partner in establishing the MPC standard, not to mention the largest consumer electronics company in the U.S.

Equally interesting is Microsoft's connection to Philips. Though Philips is expected to ship the first CD-I boxes in October, the Dutch consumer electronics giant is also known to be making MPC-labeled computers.

Though Philips has invested mega-millions of dollars into developing both titles and players based on the CD-I specification, "hedge-the-bets" is an increasingly common strategy in the multimedia world. Philips may well consider using Multimedia Windows as the foundation for a consumer player that's incompatible with CD-I to foil possible consumer rejection of its own standard.

Laptops and video. Another area of potential growth for Microsoft is laptop computers, devices already small enough to be considered "players" of sorts –especially if plug-and-play connection to a television is provided.

One possible sticking point in such a strategy might be that Multimedia Windows does not yet support full-screen, full-motion video, widely considered a requirement for a successful consumer player. And basing a consumer player on Multimedia Windows, which is essentially a set of system extensions to support sound, animation, images and limited motion video, may yield a slow device that's as unattractive to consumers as most CD-ROM-based titles are today.

In any case, the ramifications of Microsoft's change of heart are fascinating to consider. If the company develops a specification for a consumer player in the same way that it did for the MPC, it's very likely that many computer companies, already signed on for the MPC, will follow suit.

The result could well be a large number of players on the market based on a single, well-known operating system standard — a concept that is likely to intoxicate a large number of titles developers and producers, and that could even attract developers that had not before considered the potential of a consumer market.

Denise Caruso

FAST STANDARDS-MAKING IN THE DIGITAL WORLD
HDTV development may include compatibility with other displays

Last month, some Federal Communications Commission administrators went to the Massachusetts Institute of Technology to check how MIT's digital video efforts were coming along.

As a conversational aside, the FCC folks commented that each of the contenders for the high-definition television (HDTV) standard was saying it was "the most compliant" with the specifications of the Committee on High Resolution Systems (COHRS); that is, it seemed, everyone's proposals were interoperable, extensible and scalable.

The FCC folks also wondered aloud if the most general of HDTV standards, that for a universal header/descriptor, could be ready by the end of the year so it could be incorporated into the FCC's consideration.

The universal header. What is the header/descriptor and why is it so important? Here's an example from the communications world: When you make an ISDN phone call, complex descriptors called "compatibility information" identify the call as either telephony, fax group 2/3 or 4, videotex, telex, X.400 (electronic mail), Open System Interconnect (OSI) applications or, perhaps soon, video.

The computer world calls such descriptors "emulations," as in "terminal" or "look-and-feel" emulations. But all such descriptors require additional processing power. In the world of high-resolution systems, such complex descriptors or emulations for each connected device greatly increase processing requirements.

Headers would identify the variable channel rates and compression ratios being used for digital video, as well as what version of PAL, SECAM or NTSC is being transmitted, and the different transfer functions — such as contrast and color lookup curves –that each HDTV format uses.

Fast results. If this had been a normal standards effort, with reams of material and interminable international meetings stretching over years with little real effect, the FCC's request for such a specification by year's end would have been laughable.

But the header/descriptor group, which began in early 1991 as the idea of Dave Staelin of MIT, Gary Demos of DemoGraFx and Branko Gerovac of Digital Equipment, comes out of the experience of COHRS Systems). COHRS members gather regularly at major trade shows — as much to meet each other and pass information as to do standards work — and almost all its work is done via electronic mail over the global Internet and a monthly conference call. As a result, members were able to deliver some general agreements in little more than a year.

Vast potential. Although what's called the "FCC HDTV tests" are a driving force for the header/descriptor task force, other fields also must be included, such as computer graphics, scientific visualization, medical imagery, computer-aided design and military displays.

The results of this work will be flexible and abstract. All concerned hope that the open nature of the standards-development process will give the header/descriptor specification a good chance to be universally applied to these fields as well as to HDTV. If it is, the potential of interoperable, modifiable digital material will be much closer to reality.

Perhaps even more important, if this open process — using Internet and audio conferences as the main means of transferring information, articulating concerns and generating dialogue — is adapted to other projects, the entire process by which standards are developed could change.

Tom Hargadon

DIGITAL F/X ESTABLISHES SERVICE BUREAUS
Move is reminiscent of the desktop publishing revolution

In order to support and train the new breed of video producers, and to help familiarize nonprofessionals with the benefits of in-house video production, Digital F/X of Mountain View, Calif., is establishing a program to promote and support desktop video service bureaus using its Video F/X personal computer-based video editing system.

"We're doing it to make video more accessible to a larger number of people," says Barbara Koalkin, vice president of marketing for Digital F/X. "It's the same situation as the beginning of desktop publishing –it's the growth of shared resources, where people became exposed to the technology. When they used it enough, they wanted it in house to use it all the time."

Parallels between the phenomenal growth of a desktop publishing industry and the slower-but-steady growth of multimedia have been apparent for some time. It is clear that despite the differences between the two worlds, desktop publishing is indeed serving as a model for the desktop video revolution.

Koalkin says some 10 service bureaus are now established in the U.S. and Canada (with more than 100 applications in process), within both print service bureaus and professional video production shops, demonstrating how these two markets continue to intersect.

A SIMPLE SCENARIO

The scenario is simple. A producer brings in her videotapes, shot in almost any format, to be striped or time-coded. She then has two options: editing with the full Video F/X system at the bureau, or renting a large hard drive, digitizing the video and editing at home or on a rented Mac, using Soft F/X (Digital F/X's software-only editing program).

After creating an edit decision list (EDL) and any necessary graphics and animation, she brings the EDL to the service bureau to produce the final cut. Training and consultation by service bureau personnel are available to the customer throughout the process.

Knowing the ropes. In the past, only people who knew the ropes of video were able to utilize post-production tools and facilities. These service bureaus cater to both the novice user and "people who want to tap into video but don't own the toys," according to one service bureau owner, Bob Dennis of Pacific Media in Santa Clara, CA.

At his facility, a would-be video producer can rent six hours of Video F/X editing time (at $50 an hour) with two free hours of training and free follow-up support. Dennis believes that within two hours, most people are able to continue the editing process alone. He also makes available Macintosh video tools available, and computer animation-to-videotape transfer services. A typical starter project, such as editing and adding graphics to a videotaped product demonstration, could be done in a couple of hours.

PARALLELS WITH DTP

In addition to Koalkin's idea of sharing resources, another reason why desktop publishing (DTP) exploded was because all of the necessary tools were in the same place at the same time. A graphical computer (the Macintosh), Aldus's PageMaker software and Apple's LaserWriter printer combined to provide a satisfactory input, design and output option. But desktop technology was also successful because it wasn't limited to desktop quality — the 300-dots-per-inch, black-and-white output of the LaserWriter. Files produced on a Macintosh could be delivered to high-quality Linotronic typesetters.

Only some of the publishing equipment and technology came down to the consumer level. But professional publishing vendors quickly realized the practicality and popularity of the desktop market and created hooks so desktop tools could be integrated with high-end equipment. Part of this formula was the creation of service bureaus, where a desktop end user could bring her work for final, professional touches and output. These bureaus were very successful, integrating

desktop publishing, hardware and software reselling, equipment rentals, and slide and overhead production for presentations.

In much the same way, video production tools are now available and popular — if not on the consumer level, than certainly on the "prosumer," or serious enthusiast, level. In addition, corporate communicators are increasingly producing their own video presentations in house. And they, too, can use a common EDL to create master tapes for editing on high-quality post-production systems.

Connections to the desktop or desktop versions of video tools are now available from professional video production vendors (such as Quantel and Digital F/X), as well as from the computer industry and electronics vendors who are developing versions of their professional products for consumers.

VIDEO'S NOT THAT EASY

Jack Butler, of Butler Graphics in Troy, MI, another Digital F/X service bureau, does not think that the publishing paradigm holds. He feels that video is still too complicated, requiring lighting, sound, writers, producers, etc.

"It's a little too complicated for the desktop market," he says. While there are "millions of different needs" that corporations may have for desktop video, Butler sees his market not in corporate types, but in "bedroom producers" — independent producers who can't yet make the investment in their own equipment, and who need to cut online time in professional editing suites.

Slow growth. With sales of consumer camcorders and cheap pcs on a fast track, the possibilities for desktop video editing are exciting. But market growth has been something short of overwhelming.

"I don't think anyone thought the market would happen overnight," claims Koalkin. "We always recognized that it was going to develop in stages. Moving video into communications departments is the larger opportunity for us." Thus any move to let users "test-drive" products could be seen as a necessary step toward accelerating sales of desktop editing equipment.

Minimal startup cost. But everyone agrees that now is the time to enlarge the market for desktop video. Digital F/X hopes its service bureaus will provide relatively inexpensive education and training for people who are intimidated by video because they don't understand the many different levels of production quality or how the medium works.

One of Bob Dennis' customers, for example, set up a high-quality consumer camcorder on a tripod in the office of his CEO and videotaped a presentation. He brought the tape to Pacific Media, created graphics, did the editing and walked out with a tape that was eventually distributed to the entire company sales force.

The trick now is to educate and nurture these people — to create what Butler calls an "evolutionary climate." Says Dennis: "Sure there is a need for the high-end professional, but now

there is no reason for the individuals not to try it for themselves." That's what Digital F/X likes to hear.

David Baron

USING MEDIA TO TEACH MEDIA
Videodisc project focuses on electronic literacy

Media education is mandated in almost every developed country in the world except the U.S., and a growing number of educators and media professionals are worried that we know too little about how electronic media work their visual voodoo on our collective consciousness.

But because of the San Francisco-based Bay Area Video Coalition (BAVC) and a grant from the MacArthur Foundation, the non-profit group Strategies for Media Literacy is about to put a chink into this wall of ignorance. It's preparing a prototype for a new interactive videodisc project, designed to provide the first module in a curriculum for teaching media literacy in secondary schools.

THE INTERACT PROJECT

Kathleen Tyner, executive director of Strategies for Media Literacy (also of San Francisco), says BAVC — a nonprofit organization that provides access to state-of-the-art equipment for noncommercial and interactive video production — asked her to showcase SML's work as part of a 10-week BAVC program called the Interact Project. The result will be four interactive videodiscs containing the work of four nonprofit organizations.

Production will begin in mid-October, with a final project scheduled for public viewing on December 13. Tyner hopes SML's disc, tentatively titled "The Human Communication Project," will serve as a springboard for two other videodisc "modules" on media literacy in information dissemination and entertainment.

When the advertising module is in place, she says, SML will raise funds for the other two modules. "BAVC offers us a good opportunity to fund a prototype to get the funding started," says Tyner. "In addition, we can use the prototype in our teacher workshops, and even sell it through the nonprofit."

Candid camera. Tyner says she's hoping to convince advertising museums such as the Smithsonian Institute's Center for Advertising History to let SML use their contents as fodder for the project. The Smithsonian's archives include television advertisements as well as interviews with acclaimed advertising executives candidly discussing their work.

"We have to convince ad executives who donated advertising memorabilia to the Smithsonian to let the Center release the content for schools," says Tyner. "The problem is that we're walking a fine line –we're asking to use their material, but with the freedom to be critical of it. We could just limit the discussion to aesthetics, but we think it's important to talk about process and ideology, too."

The videodisc, which will use Apple's HyperCard as its interface, will be produced for $30,000 – though BAVC's executive director David Bolt says the actual cash cost will be much less, since the budget includes use of BAVC's formidable array of equipment.

The only caveat, says Bolt, is that the prototype disc cannot be commercially distributed or sold to a commercial digital-media publisher. However, Tyner says SML can use the same concepts in a commercially viable product.

THE LARGER QUESTION

SML, which serves as a champion for media education and a clearinghouse for educators, has already published a media literacy curriculum for primary schools in book form, called Media and You.

Its purpose is to introduce children to how television and movies are produced, the technical tricks they use to inform, and the myriad schools of thought about the social, psychological and physiological effects of mass media.

Get smart. "The important thing is to bring the emotional content of visual media into the realm of rational discourse," says Tyner. "People are really naive about mass media, especially its commercial implications."

Fighting this naivete is a vital mission, and one that those engaged in the growing digital media industry would do well to support. As companies such as Digital F/X are discovering, expecting potential customers who have no grasp of how media work to buy expensive video editing tools is quixotic, to put it mildly, no matter how great the perceived need (see story, pg. 13).

Teaching the teachers. Thus, expecting digital media products to catch fire in the schools — a venue where they have the potential to do enormous good — is even more unreasonable, given the present level of awareness in the teaching community. "Teachers don't even know the difference between film and video," says Tyner. "The younger teachers especially are clamoring for media education."

Denise Caruso

ADOBE ENTERS VIDEO MARKET
Purchases ReelTime software from SuperMac

SuperMac Technology has agreed to sell its much-touted (and as yet unreleased) ReelTime video editing software to Adobe Systems, signaling significant changes for both companies.

The package had been on the block for six months. Bidders included Microsoft, Aldus and Adobe. Claris was not in the bidding, according to Steve Blank, SuperMac's vice president of marketing. "It's unfortunate that Apple's software arm will be the last one out with digital video QuickTime-based products instead of the first," he says.

The sale to Adobe, says Blank, is good news for people in the Macintosh business. "Microsoft was a vendor of last resort," he says. "Video is a while away for Microsoft."

SuperMac had invested significant time and money developing ReelTime to support its VideoSpigot video capture board, and it had been showing ReelTime at industry conferences and analyst meetings for more than a year.

Blank noted that selling ReelTime was like "trading away a first-round draft choice." But he feels that by explicitly choosing a buyer such as Adobe, SuperMac will reap more than just financially significant rewards.

Adobe has proven its ability to popularize new classes of software, as evidenced by the success of its Photoshop image manipulation software as well as the industry-standard PostScript page description language.

From print to video. This acquisition is a noteworthy departure for Adobe. The company has a very successful application software business, but, until now, all of Adobe's products have been focused on communicating information effectively in print. With the purchase of ReelTime, the seminal desktop publishing company has moved into desktop video.

ReelTime, which enables the user to arrange "clips" of video, animation or audio over a time line, was a neat segue into what Adobe sees as the next phase of desktop publishing. It allows for the manipulation of multiple video sources, as well as effects and transitions, automatic thumbnail creation and representation of all video clips in use.

Thus far, Adobe has proven exceptionally adept at acquiring software products, perfecting them, and marketing and supporting them. It will certainly do the kind of job with ReelTime that SuperMac, a hardware company with limited resources and no "critical mass" in the application software business, could not have done.

Sticking with hardware. SuperMac will continue to market the hardware part of its video solution. VideoSpigot is a video capture board that enables the user to digitize video at 15 frames per second and save it to a hard disk, using the JPEG standard for image compression. The video can be stored in a number of standard file formats, including pics and Movie, Apple Computer's new format for time-based data that is part of its QuickTime extensions to Macintosh system software.

Blank says SuperMac will continue development of Digital Film, its hardware product that captures, digitizes and plays back a full screen of video at 30 frames per second. He says the product will be ready in time for January's Macworld Expo in San Francisco.

The ReelTime-VideoSpigot combination is the first iteration of hardware and software products to use QuickTime extensions for creating start-to-finish digital videos on the Macintosh. One insider said the products make QuickTime real — not to mention that they beat the Multimedia PC to the punch with video support on the system level, support that's not yet available in the Multimedia Windows specification. (In fact, Microsoft just recently added JPEG compression for still images only to Multimedia Windows.)

Planning enhancements. Adobe plans to add minor enhancements to ReelTime before the initial release. It will be working closely with SuperMac to create versions 1.0 and 1.1. Sources say that the specifications for 2.0 will also be worked out between the two companies.

But Adobe will be calling the shots. First, the product's name will be changed, although the new name is still being cleared through copyright lawyers. Then, programmers will write software connections, or "hooks," to Photoshop, Adobe's image manipulation software.

New desktop effects. Thus, ReelTime will be capable of creating special effects in desktop video — the ability to actually alter images, for example — that have been unavailable, to date, in any other desktop motion-image software package. Transparency settings, graphic tools and filters will be available to manipulate the video images. In addition, the transitions in ReelTime, such as zooms and fades, are all modules that, like the filters in Photoshop, can be added by third parties without necessitating a new release of the product.

Tim Myers, ReelTime product manager for Adobe, says that Adobe plans to bring the product "in line with its professional products," implying significant future enhancements, as well as a higher price tag. (One can at least imagine better integration of PostScript images and text on the screen.) Myers said that Adobe is also waiting to see what Apple changes in QuickTime 2.0 so that they do not duplicate effort.

Adobe and SuperMac will initially bundle ReelTime and VideoSpigot. Pricing, shipping dates and the name are not yet final, and terms of the sale were not released.

No software for SuperMac. The deal officially signals SuperMac's abandonment of the software market, to which it once devoted an entire division. As recently as the Apple System 7.0 rollout in May, SuperMac Software was actively seeking unpublished applications.

SuperMac has since decided to sell all its individual software products. Remaining to date are PixelPaint and PixelPaint Professional, both of which are currently on the selling block.

Blank feels that the software market is too expensive for SuperMac to participate effectively, and that the company will be better off focusing on hardware peripherals. "Creating version 1.0 of any software is the easy part," he says. "It is extremely difficult to evangelize a new class of applications and make the product competitive in the new market."

David Baron

FUJI FORMS STRATEGIC ALLIANCE WITH ZORAN
To concentrate on digital still video

As we keep pointing out, digital image compression is the key that will unlock a host of applications: from digital still video to digital television, interactive multimedia, picture phones and video teleconferencing — the list is as long as your imagination. At the moment, the leaders in image compression hardware and software are virtually all American. Except for Intel, they are mostly small Silicon Valley firms: Compression Laboratories, C-Cube Microsystems, Storm Technologies, Zoran, etc.

These companies are forming relationships and alliances with larger companies who will drive products into the business and consumer markets. The alliances they make are based in part on their estimates of what products and technologies will drive the market, and in part on whom they are able to make deals with.

Thus, Compression Laboratories will supply the compression/decompression technology for the SkyPix direct broadcast satellite venture. C-Cube has signed deals with JVC and Philips for chips to be used to decode compressed motion video stored on interactive CD-ROM.

Zoran, a developer of application-specific VLSI (Very Large-Scale Integration) image processors, has recently formed an alliance with Fuji Photo Film to develop image compression/decompression technology for digital video applications.

Digital still video. All of the still video cameras in the market are based on the analog technology originally used in the Sony Mavica. A video field (every other scan line) or video frame (a full set of 480 scan lines) is recorded as an analog signal onto a small magnetic disk. The disk reader samples the analog signal and coverts it into digital form for use in computer applications.

At the giant PhotoKina show last fall, Fuji showed a prototype of a digital still-video camera that captures the image, digitizes it, compresses the digital information and records it onto static ram contained in a removable credit card-sized card. The image resolution is exceptionally high for video: 768 pixels per scan line — not quite twice the resolution of a laser disk or S-VHS tape. An 8-megabyte card holds 5, 10 or 20 images (at 1/4, 1/8 and 1/16 compression respectively.) Production versions will hold 36 images at 1/24 compression.

The chip technology that performs this compression (as well as the decompression in the reader box that interfaces to your television set or computer) was developed jointly by Fuji and Zoran. It makes use of "JPEG-like" discrete cosine transform algorithms.

The future of still video. We have long been intrigued with still video. The systems we have had in our office have been remarkably popular with all of our staff members, not just the techno-junkies. The ability to point a camera at an image, capture it, then read it into your computer is very seductive. Bear in mind, however, that these were people who had access to relatively powerful computers, color monitors, and image processing software that let them perform creative image manipulations and include images in a variety of documents. You do not have these capabilities on your home television set.

The Japanese manufacturers have conceived of still video as a consumer hobbyist technology that must be tied to existing TV sets. The greatest interest in the U.S. market has been in still video as a means of capturing images to be fed into a computer and/or transmitted over the phone network. The most obvious applications are publishing related (newspapers, technical documentation, real estate directories, etc.), archival (insurance or medical records) or database related (employee directories, etc.). The biggest limitation for most of these applications has been image quality. If your object is computer input, there is no need to limit yourself to video resolution — especially since you want considerably better-than-video quality for most print applications.

The Fuji/Zoran announcement suggests that the Fuji digital still video cameras and readers will come to market. We hope that the image quality will be sufficient for the applications that could really make use of this technology.

Jonathan Seybold

STEVE ARNOLD JOINS GATES AT IHS
The goal: defining digital publishing beyond CD-ROM

Though met with little public fanfare, the news that Steve Arnold was leaving his post as vice president of the New Media Group at LucasArts Entertainment in San Rafael, CA, was a signpost for the digital media industry. After seven and a half years at Lucas, Arnold has taken a post as president and CEO of Interactive Home Systems, Inc. (IHS), a company founded and chaired by Microsoft's Bill Gates.

Experience and clout. IHS was founded in 1989 with the intention of creating the technology and the business framework to develop digital image banks for works of art. Arnold's experience in interactive technologies, combined with Gates's formidable financial and industry clout, make IHS and the framework it builds for its business worth watching closely.

After joining Lucasfilm in 1984, Arnold first managed the Games Group of Lucasfilm Computer Division. He established Lucasfilm Learning in 1987 to develop tools and titles for multimedia in education. In 1990, he established Rebel Arts and Technology, a LucasArts public-space entertainment software venture for theme parks, shopping malls and new entertainment venues.

Arnold also held VP and director positions at Atari during its halcyon days. And Gates, as most people know, is the driving force behind the world's largest and most influential microcomputer software company.

Acquiring new skills. Images and video have assumed a starring role in media-based titles, so the licensing of digital rights is a new skill that many owners and developers are trying to perfect. Because of Gates's high profile, content owners and developers have carefully watched Microsoft with both excitement and caution.

A DIGITAL HOME MUSEUM

Gates cut his first deal with the Seattle Art Museum in March 1991 for nonexclusive rights to more than 1,000 of the museum's collection of 18,000 objects. It was IHS's first step toward creating a so-called digital "museum" where, as former IHS general manager Terry Lipscomb said in one report, interactive walls bearing high-definition screens could be programmed to display alternating sets of images.

Though such a project probably sounds a little Star-Trekkish now, it's widely believed that Gates is developing just such a museum for his own home. In addition, the project neatly highlights the problems any company faces in developing digital media products — the first of which is the licensing of content.

Licensing concerns. According to museum consultant David Bearman, president of Archives and Museum Informatics of Pittsburgh, PA, copyright holders were and are excited by the prospect of making large image banks available for multimedia titles, but they are hesitant about the actual business terms that IHS was proposing.

"I don't know what change in direction happened since Steve came, but…18 months ago…IHS had been interested in making a one-time payment in exchange for a permanent license," says Bearman. "That's not particularly attractive in a market that no one knows what its size or potential will be. There are just too many questions about digital image rights and how one protects them to make anyone comfortable with the notion of giving away even nonexclusive permanent rights."

Though Arnold is somewhat circumspect on the subject, he says the actual terms of licensing agreements aren't as important to IHS as its broader charter: nothing less than a redefinition of digital publishing for the next decade. To achieve this goal, IHS is attacking a series of thorny, mission-critical problems.

Prying loose the fingers. First and foremost, IHS will tackle the building of a comprehensive image base. This project will entail solving a universal problem: prying loose the fingers of skittish content providers from their properties to make them available for licensing in the first place.

In addition to being concerned about licensing agreements, it's also likely that owners will require solid reassurance from whomever buys digital rights that they can protect properties from piracy and alteration.

Though IHS isn't yet talking about this area of concern, Gates may have a head start: Microsoft has already announced that it intends to support a security scheme called public-key encryption in certain upcoming product releases, and Gates's familiarity with the technology makes it likely he'll consider it for IHS as well.

How to protect properties? Public-key encryption is based on a simple yet highly efficient mathematical formula that, when applied to digital data, produces a file that's not only unreadable but irreproducible without proper "keys" provided by both the user and the owner of the file. It also ensures that the file has not been altered in any form.

Public key is so effective that the National Security Agency has been bucking to keep it out of the public's hands, so far without success. The system has not yet been deployed on a large scale to protect digital media, but it is already being used by one company that distributes digital audio into the home. It is also being considered by a major studio to protect digital movies from being copied after they've entered the distribution channel.

Improving images. But equally important to the licensing questions is what Arnold calls "doing justice to the work" — i.e., the quality and presentation of digital images. Until IHS has scaled that technical hurdle, he says, IHS will only worry about establishing working relationships with a few key sources of material.

What are the IHS engineers working on? "We're building the software technology to create and manage digital libraries of high-resolution images," says Arnold. IHS engineers have already developed image enhancement tools to reproduce, as closely as possible, the quality of the original image.

What specific tools and techniques IHS is developing, as well as what it will do with them once they're finished, is unknown. But given Microsoft's clout in standards-setting, one might also assume that the company will eventually sell or license its technology to other title producers.

The importance of IHS. If IHS can meet basic security requirements and provide quality image reproduction, its next task will be to convince content owners that licensing their images to IHS for interactive titles will result not only in revenue, but in products that provide access to more and better information — and a higher quality of interaction — than a viewer might get by simply walking through a museum.

Robert Abel's seminal Guernica videodisc demonstration project, a rich melange of video, still images, sound and text about the famed Picasso painting, is proof that the concept indeed has "legs," as they say in the movie biz. Unfortunately, Guernica never made it out of the prototype stage, partly because of the very copyright roadblocks that IHS is trying to break through.

Raising the level of discussion. Another area IHS will tackle is to help creative professionals, museums and photographers explore and understand the capabilities of digital media and digital publishing for the future, beyond the formidable limits of today's technology.

"The concept does much more than cover digital images for art," says Arnold. "We want to provide the capability for production people to create a wide array of applications, as well as develop a system that allows broader access to this information for everyone."

These goals are ambitious. But whatever else you might say about Gates, once he gets his teeth into a project he doesn't let go. He's certainly been visionary in the area of digital media — Microsoft has championed CD-ROM since 1984, long before there was a dime to be made from it, and it has consistently put its money where its mouth is to further CD-ROM's adoption.

Unfortunately, now that CD-ROM technology is finally being adopted on a wider scale, its defects are also becoming more apparent. Thus, it appears, Gates and his team are gearing up for a new challenge, and IHS looks to be their chosen vehicle for launching the next wave of innovation. As Arnold says, "We're changing it all, and it's not all about computers."

Denise Caruso

CONTENT
SPACESHIP WARLOCK
"Interactive movie" pushes the envelope on CD-based entertainment

Although on first spin a user might be tempted to call this title a game, Spaceship Warlock (from Reactor Inc.) is billed as an interactive movie.

What's that? Since the genre is still loosely defined at best, an "interactive movie" could be almost anything. Like some role-playing games and all movies (well, maybe not all, considering what's coming out of Hollywood these days), there is a plot — and you are a character in that plot. The story follows you (or vice versa) as you are kidnapped by space pirates and ultimately help them fight the prototypical evil empire, which has blasted the planet Terra out of its orbit and into the void of space. The pirates of Spaceship Warlock, at first glance a truly smarmy bunch, are really trying to find and rebuild Earth.

Great graphics. What's most obviously impressive about Spaceship Warlock is that the worlds through which you travel are realized via truly imaginative 3D graphics and animation effects created by Reactor's Joe Sparks, a former aerospace simulation artist for NASA/Ames Research labs. (Sparks, who is also a musician, is responsible for the catchy tunes throughout the title as well.) The disc is worth buying just for the graphics and effects.

Entire cities, spaceships and a multitude of alien creatures occupy the screen. Most of the action is seen from a first-person point of view, i.e., as if you were holding the camera, but there are also expository animations that set the scene or play out a battle. The producers of Spaceship Warlock have borrowed significantly from Hollywood to create these animations.

Not a game, not a movie. You begin on a rather desolate, urban planet and learn pretty quickly that it is in your best interests to leave ASAP. Though the title has a linear thread — like a movie — you must, like a good game player, figure out how one accomplishes the required task. For a first-time game player, this is no mean feat — and herein lies the rub. Though the majority of people who've played with Spaceship Warlock love it, die-hard game players think it's too easy, and dedicated movie-watchers find it perplexingly difficult.

We suspect this was a fine line for Reactor to walk; thus, it's not surprising that the title is perceived so differently by these two groups. Those used to games want Warlock to be a lot harder than it is, and they don't quite understand that movie lovers don't like to think too hard.

People who really want to experience an "interactive movie," i.e., a story line they get to participate in without a whole lot of thought, are equally stymied by the need for some proficiency with gaming — at the very least, knowing what kinds of questions to ask to move you to the next level of action. Long acquainted with the joys of passively absorbing what a director wants them to see, traditional movie lovers, or those uninitiated with gaming conventions, may very well give up in frustration and mightily fight the urge to use the Warlock disc as a frisbee.

IS THE BEST INTERFACE NO INTERFACE?

The paradigm for the structural design of this title is that of a discovery game: it is up to you, the user/player, to find or discover the clues that allow you to move forward. Choices arise, and you may have a number of options — some of which move you along, while others "kill" you instantly. Such games, and there are many of them, rarely have an elaborate user interface; the game will only give you feedback to your own actions. This raises the question: When is no interface the best interface?

Games rely on user logic. Games require trial and error, and in the specific case of Spaceship Warlock, you may find yourself clicking on the mouse for days trying to get something to happen. This title definitely subscribes to the minimalist school of user interface — for everything from moving through the scenes to acquiring and using objects, only a bare amount of instruction is given. The rest is up to you to figure out, with wildly fluctuating results.

For example, you may be given a warning about some impending danger: "You feel intense heat coming from your left." You look left and sure enough, the floor is on fire. Using only the map of the tunnels through which you are traveling, you must figure out whether you can get around the fire (you can't), or some way to put it out (it would be unfair to tell you how).

Speed: the curse of CD-ROM. If you have some familiarity with the video game world, however, the next roadblock you meet with Warlock is the slow access time of CD-ROM. (As mentioned in last month's review of Verbum Interactive, this will be a recurring theme in criticism of CD-based titles.)

But the creators of Spaceship Warlock have taken great pains to compensate. A big part of this workaround is the catchy soundtrack. Rarely are you left waiting in silence for the screen to change, which has a remarkable effect on the way the game feels. With the sound turned down (you cannot turn the sound off), the waiting becomes much more apparent and annoying.

This disc, then, is an object lesson in how to use sound and sound effects effectively, without making them appear as useless or gratuitous as they so often do. The drawback to the soundtrack is that it can get annoyingly repetitive because the music relies heavily on short sampled clips that loop over and over again. This is one way to minimize the amount of data that must be processed by the computer from the CD. (Spaceship Warlock requires a Macintosh with 4 megabytes of random access memory, an 8-bit monitor and, obviously, a fast CD-ROM drive. The data files themselves require an enormous 128 megabytes of storage if you want to load them onto a hard disk.)

No response. Another speed problem is far more serious: the program cannot respond to the fast pace necessary for a computer game. You find yourself clicking wildly at the mouse without any response. It is quite frustrating to be caught up in a battle against evil space aliens and not be able to act and react quickly. The compromise is that your enemy is not attacking you with any blinding speed either. So at least it's a fair match.

This, however, is not totally a CD-ROM problem. Spaceship Warlock was constructed with MacroMind Director — an animation program — and its interactivity tools are not sophisticated enough or optimized for the kind of speed that video games require.

Reactor president Mike Saenz says the Macintosh itself is another speed culprit. Anything that has to do with graphics display is slow on the Mac, since it doesn't build in the dedicated, fast animation chips that even cheap video game machines have.

WHAT'S ITS SIGNIFICANCE?

Despite the limitations of the technology upon which the title is based, Warlock is beautiful. For that we can thank former comic book artist Saenz, who worked hand-in-hand with Sparks to create characters, write, direct, animate and program. And considering the sheer heft of the title, we are reminded of the old "dancing bear" adage: the wonder is not that it interacts well, but that it interacts at all.

Spaceship Warlock doesn't break new ground as a game, but it does show very well how interactivity can be added to a linear plot. If we look at Spaceship Warlock as an interactive movie, or more appropriately a prototype for an interactive movie, we begin to see how today's visual media may soon be dramatically reformed.

Japan, Inc., loves it. But what's more impressive about Warlock than its present is its future. Reactor is working on a new engine for the title, sans Director, which should speed interactivity significantly. And Saenz says he and Sparks just returned from a trip to Japan, where many of the giants in the video game market have expressed "strong interest" in converting Warlock to formats that can run on their game machines.

David Baron and Denise Caruso

Spaceship Warlock, $95.00
Reactor, Inc., 3110 N. Sheffield Ave., Chicago, IL 60657
(312) 528-1600

EVENTS

Seybold Computer Publishing Conference + Expo
Oct. 1-4, San Jose, CA
Seybold Seminars
(213) 457-5850, fax (213) 457-4704

The annual "must attend" event in computer publishing and graphics, with an increasing emphasis on digital media and electronic publishing.

Intertainment '91
Oct. 7-9, Los Angeles, CA
Alexander & Associates
(212) 382-3929

The focus is on interactivity and entertainment. Last year's conference was worthwhile because of its array of topics and speakers from the cable and interactive TV industries, video games and satellite delivery systems.

ICHIM '91
International Conference on Hypermedia and Interactivity in Museums
Oct. 14-16, Pittsburgh, PA
(412) 683-9775, fax (412) 683-7366

More than 80 speakers from 18 countries will attend this event, supported in part by Interactive Home Systems, Apple Computer, IBM and Next.

International TAPE (Technology, Aesthetics, Politics & Education/Entertainment) Symposium
Oct. 16-18, San Rafael, CA
Dominican College Academy of Professional Development
(415) 485-3255

Celebrating the college's 100th anniversary and the 100th anniversary of film, this symposium is for media professionals, technologists, business leaders, artists and scholars who have an eye turned toward the 21st century.

New Media in the '90s
Oct. 10, San Francisco, CA
MediaSense, Inc.
(800) 832-4491

This is the first of six day-long workshops across the country for professionals whose businesses, organizations or careers are linked to media and communication. They are designed to answer specific questions about integrating new media into the business setting, and to introduce attendees to some of the industry's premier producers of multimedia-type products.

Upcoming workshops are located in Chicago, Boston, Washington D.C., Los Angeles and New York.